# μA741

# HIGH PERFORMANCE OPERATIONAL AMPLIFIER

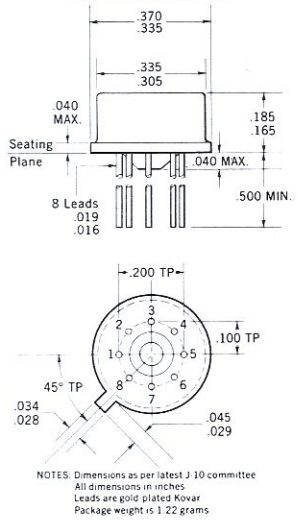
## FAIRCHILD LINEAR INTEGRATED CIRCUITS

- **NO FREQUENCY COMPENSATION REQUIRED**
- **SHORT-CIRCUIT PROTECTION**
- **OFFSET VOLTAGE NULL CAPABILITY**
- **LARGE COMMON-MODE AND DIFFERENTIAL VOLTAGE RANGES**
- **LOW POWER CONSUMPTION**
- **NO LATCH UP**

**GENERAL DESCRIPTION** — The μA741 is a high performance monolithic operational amplifier constructed on a single silicon chip, using the Fairchild Planar* epitaxial process. It is intended for a wide range of analog applications. High common mode voltage range and absence of "latch-up" tendencies make the μA741 ideal for use as a voltage follower. The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifier, and general feedback applications. The μA741 is short-circuit protected, has the same pin configuration as the popular μA709 operational amplifier, but requires no external components for frequency compensation. The internal 6dB/octave roll-off insures stability in closed loop applications.

### PHYSICAL DIMENSIONS

in accordance with JEDEC (TO-99) outline



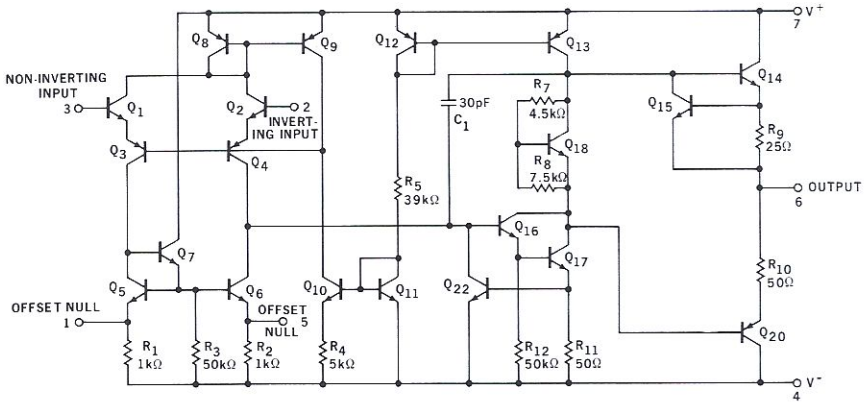

NOTES: Dimensions as per latest J-10 committee
All dimensions in inches
Leads are gold plated Kovar
Package weight is 1.22 grams

**ORDER PART NO. U5B7741312**

### ABSOLUTE MAXIMUM RATINGS

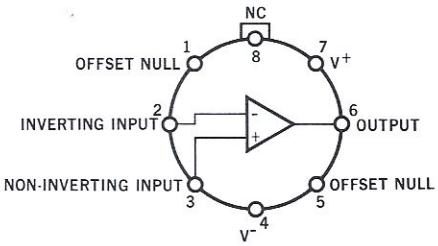
| | |
|---|---|
| Supply Voltage | ±22 V |
| Internal Power Dissipation (Note 1) | 500 mW |
| Differential Input Voltage | ±30 V |
| Input Voltage (Note 2) | ±15 V |
| Storage Temperature Range | −65°C to +150°C |
| Operating Temperature Range | −55°C to +125°C |
| Lead Temperature (Soldering, 60 sec) | 300°C |
| Output Short-Circuit Duration (Note 3) | Indefinite |

### SCHEMATIC DIAGRAM




### CONNECTION DIAGRAM

(TOP VIEW)




**NOTE: PIN 4 CONNECTED TO CASE**

**NOTES:**

(1) Rating applies for case temperatures to 125°C; derate linearly at 6.5 mW/°C for ambient temperatures above +75°C.

(2) For supply voltages less than ±15 V, the absolute maximum input voltage is equal to the supply voltage.

(3) Short circuit may be to ground or either supply. Rating applies to +125°C case temperature or +75°C ambient temperature.

*Planar is a patented Fairchild process.

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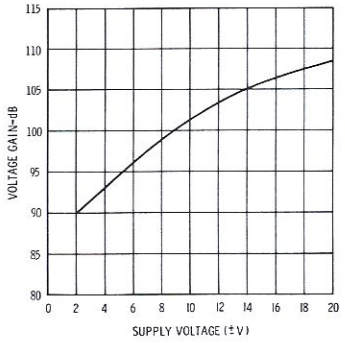
MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U. S. PATENTS: 2981877, 3015048, 3025589, 3064167, 3108359, 3117260; OTHER PATENTS PENDING.

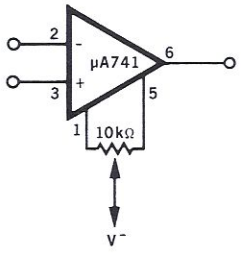
**ELECTRICAL CHARACTERISTICS** ($V_S = \pm 15$ V, $T_A = 25°C$ unless otherwise specified)

| PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|
| Input Offset Voltage | $R_S \leq 10$ kΩ | | 1.0 | 5.0 | mV |
| Input Offset Current | | | 30 | 200 | nA |
| Input Bias Current | | | 200 | 500 | nA |
| Input Resistance | | 0.3 | 1.0 | | MΩ |
| Large-Signal Voltage Gain | $R_L \geq 2$kΩ, $V_{out} = \pm 10$ V | 50,000 | 200,000 | | |
| Output Voltage Swing | $R_L \geq 10$ kΩ | ±12 | ±14 | | V |
| | $R_L \geq 2$ kΩ | ±10 | ±13 | | V |
| Input Voltage Range | | ±12 | ±13 | | V |
| Common Mode Rejection Ratio | $R_S \leq 10$ kΩ | 70 | 90 | | dB |
| Supply Voltage Rejection Ratio | $R_S \leq 10$ kΩ | | 30 | 150 | μV/V |
| Power Consumption | | | 50 | 85 | mW |
| Transient Response (unity gain) | $V_{in} = 20$ mV, $R_L = 2$ kΩ, $C_L \leq 100$ pF | | | | |
| Risetime | | | 0.3 | | μs |
| Overshoot | | | 5.0 | | % |
| Slew Rate (unity gain) | $R_L \geq 2$ kΩ | | 0.5 | | V/μs |
| The following specifications apply for $-55°C \leq T_A \leq +125°C$: | | | | | |
| Input Offset Voltage | $R_S \leq 10$ kΩ | | | 6.0 | mV |
| Input Offset Current | | | | 500 | nA |
| Input Bias Current | | | | 1.5 | μA |
| Large-Signal Voltage Gain | $R_L \geq 2$kΩ, $V_{out} = \pm 10$ V | 25,000 | | | |
| Output Voltage Swing | $R_L \geq 2$ kΩ | ±10 | | | V |

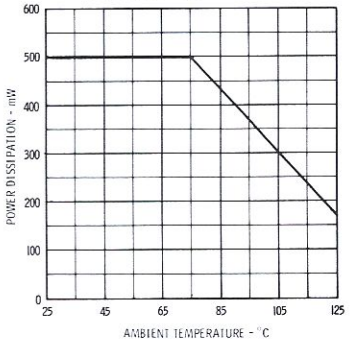
**OPEN LOOP VOLTAGE GAIN**



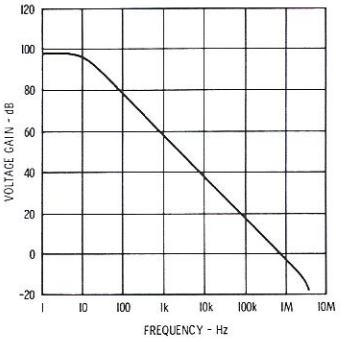

**VOLTAGE OFFSET NULL CIRCUIT**



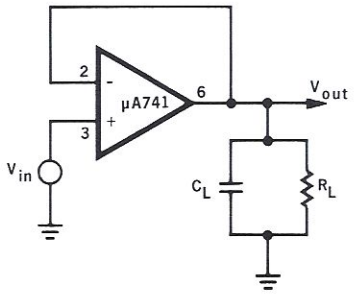

**ABSOLUTE MAXIMUM POWER DISSIPATION**



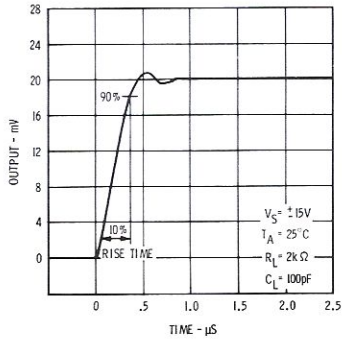

**OPEN LOOP FREQUENCY RESPONSE**




**TRANSIENT RESPONSE TEST CIRCUIT**




**TRANSIENT RESPONSE**

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